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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,961	02/22/2006	Mitsuyoshi Mori	0719710423	8584
53080 7590 10/04/2007 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, NW WASHINGTON, DC 20005-3096			EXAMINER PATEL, REEMA	
			ART UNIT 2812	PAPER NUMBER
			MAIL DATE 10/04/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/568,961

Applicant(s)

MORI ET AL.

Examiner

Reema Patel

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 63-86 is/are pending in the application.
- 4a) Of the above claim(s) 63-69, 72-76, 78-80, 82 and 84-86 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 70, 71, 77, 81 and 83 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/22/06, 4/17/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of the claims of group III in the reply filed on 7/10/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Examiner also notes the typographical error in applicant's listing the claims of group III as 70-81, 77, 81 and 83 instead of 70-71, 77, 81, and 83.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement filed 2/22/06 and 4/17/06 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. Copies of several of the foreign patents, listed in the information disclosure statement, have not been supplied. The information disclosure statements have been placed in the application file, but the information referred to therein referring to the foreign patents not supplied has not been considered.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 70-71, 77, and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (2003/0127667 A1) in view of Ishizuka et al. (JP 2002-100671).

6. Regarding claims 70-71, 77, and 83, Inoue et al. discloses a solid state imaging device, for use in a camera device ([0002]), in which a plurality of unit pixels are arranged on a substrate, each unit pixel including a plurality of element formation regions (32, Fig. 1) and element isolation regions (36, Fig. 1) between the element formation regions ([0007]-[0008]). Inoue et al. discloses that the element isolation regions comprise of trenches ([0007]) but does not disclose the specific steps (a)-(d) in forming the trench isolation regions.

However, Ishizuka et al. discloses forming trenches by (a) forming a protection film including an opening portion; (b) forming a sidewall in the opening in the protection film; (c) forming a trench by etching using the protection film and the sidewall as a mask; and (d) burying the trench with a burying film. Ishizuka et al. also discloses oxidizing a surface portion of the trench after step (c) and before step (d) (Abstract). The advantage of forming the trench as disclosed by Ishizuka et al. is the suppression of foreign material generation (Abstract). Therefore, it would have been obvious to one

having ordinary skill in the art at the time the invention was made to modify the invention of Inoue et al. with forming the trench of the element isolation regions according to Ishizuka et al. so as to suppress the generation of foreign materials in the trench.

7. Claim 81 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (2003/0127667 A1) in view of Ishizuka et al. (JP 2002-100671) as applied to claim 70 above, and further in view of Houston (U.S. 6,096,612).

8. Regarding claim 81, Inoue et al. and Ishizuka et al. disclose forming an element isolation region of a solid-state imaging device. Inoue et al. and Ishizuka et al. disclose that the element formation regions of the semiconductor substrate includes an n-type impurity (Inoue et al., [0008]) but do not disclose the step of implanting a p-type impurity into the surface of the trench of the semiconductor substrate between steps (c) and (d) of forming the element isolation regions.

However, Houston discloses implanting a p-type impurity into a trench after its formation but before adding a burying film (col 6, lines 7-64). The advantage of this step is to form a channel stop, which decreases the effective width of the active areas (col 1, lines 52-54). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the solid-state imaging device of Inoue et al. and Ishizuka et al. with forming a channel stop so as to decrease the effective width of the active areas.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reema Patel whose telephone number is 571-270-1436. The examiner can normally be reached on M-F, 8:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RSP
9/24/07

SCOTT B. GEYER
PRIMARY EXAMINER

S.B.G.

9/28/07